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Indian Standard

SHORT PITCH TRANSMISSION PRECISION ROLLER CHAINS AND CHAIN WHEELS

(Second Revision)

First Reprint NOVEMBER 1996

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

October 1991

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Indian Standard

SHORT PITCH TRANSMISSION PRECISION ROLLER CHAINS AND CHAIN WHEELS

(Second Revision)

NATIONAL FOREWORD

This Indian Standard (Second Revision) which is identical with ISO 606 : 1982 'Short pitch transmission precision roller chains and chain wheels', issued by the International Organization for Standardization (ISO) was adopted by the Bureau of Indian Standards on the recommendation of the Transmission Devices Sectional Committee (LMD 10) and approval of the Light Mechanical Engineering Division Council.

This standard was first published in 1964. It was revised in 1975 taking assistance from ISO 606 : 1982. This second revision has been harmonised with ISO 606 : 1982.

In the adopted standard certain terminology and conventions are, however, not identical to those used in Indian Standards. Attention is particularly drawn to the following:

a) Wherever the words 'International Standard' appear referring to this standard, they should be read as 'Indian Standard'.

b) Comma (,) has been used as a decimal marker while in Indian Standards, the current practice is to use point (.) as the decimal marker.

In this adopted standard, reference appears to certain International Standards for which Indian Standards also exist. The corresponding Indian Standards which are to be substituted in their place are listed below along with their degree of equivalence for the editions indicated:

International Standard	*Corresponding Indian Standard*	*Degree of Equivalence*
*ISO 286/1 : 1988	IS 919 (Part 1) : 1963 Recommendations for limits and fits for engineering : Part 1 General engineering	Technically eqivalent
*ISO 286/2 : 1988		

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*Revision of earlier version.

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0 Introduction

The provisions of this International Standard have been arrived at by including sizes of chains used by the majority of countries in the world, and by unifying dimensions, strength and other data in respect of which current national standards were differing and at the same time eliminating certain side ranges listed in some national standards for which it was considered a universal usage had not been established.

The whole applicational field open to this medium of transmission has been covered by the ranges of chains already established. To achieve this the sizes of 12,7 mm (0.5 in) to 76,2 mm (3.0 in) pitch inclusive have been duplicated by the inclusion of chains derived from standards originating in the western hemisphere and centred around ANSI (suffix A) and, on the other hand, by chains representing the unification of the principal standards originating in Europe and centred around BSI (suffix B), the two being complementary for the coverage of the widest possible field of application.

The part of this International Standard covering chain wheels represents the unification of all the relevant national standards in the world and includes, in particular, complete tolerances relating to tooth form which are absent from most current national standards.

The dimensions of chain specified ensure complete interchangeability of any given size and provide interchangeability of individual links of chains for repair purposes.

1 Scope and field of application

This International Standard applies to short pitch precision roller chains of simple and multiplex construction suitable for the mechanical transmission of power and allied applications, together with the tooth gap forms and rim profiles of their associated chain wheels. It covers dimensions, tolerances, measuring loads and minimum breaking loads.

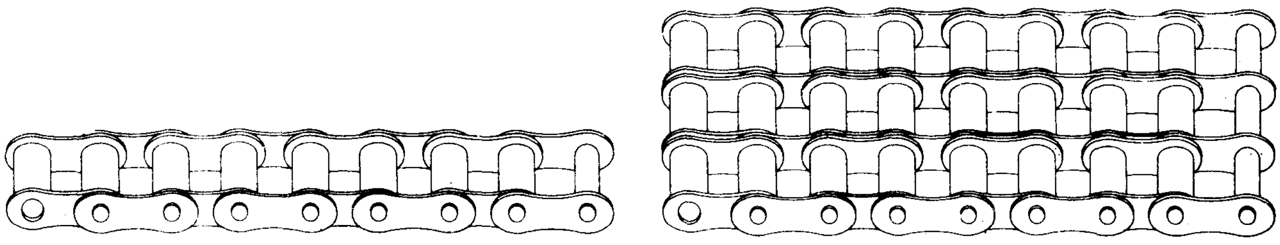
2 Reference

ISO 286/1, *ISO system of limits and fits — Part 1 : General, tolerances and deviations.*[1]

3 Chains

3.1 Nomenclature

Figures 1, 2 and 3 do not define the actual form of the chain plates.



Roller chain, simple

Roller chain, multiple (triplex)

Figure 1 — Roller chains

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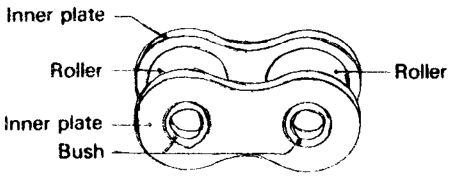
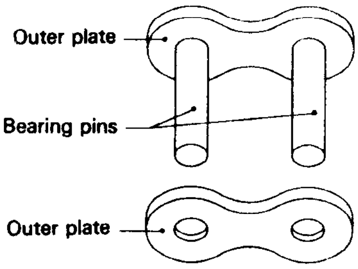
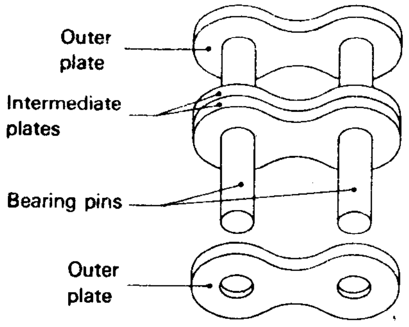
[1] At present at the stage of draft. (Revision of ISO/R 286-1962.)



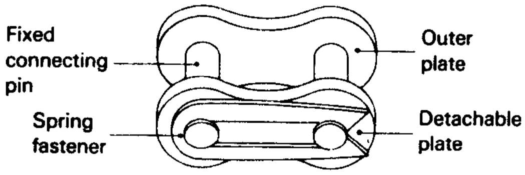
Inner link



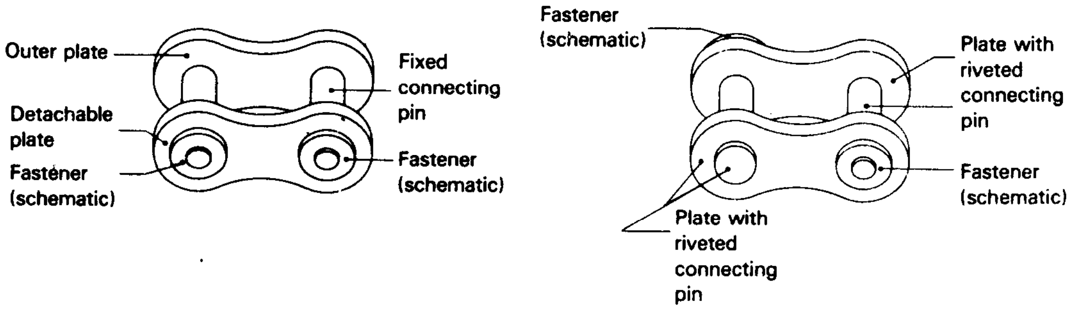
Outer link simple



Outer link duplex

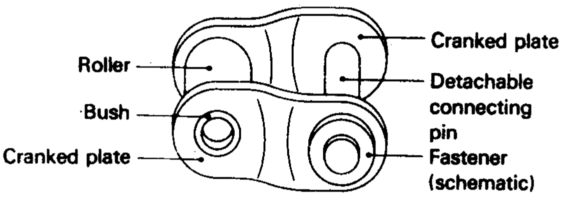


Connecting link with spring fastener

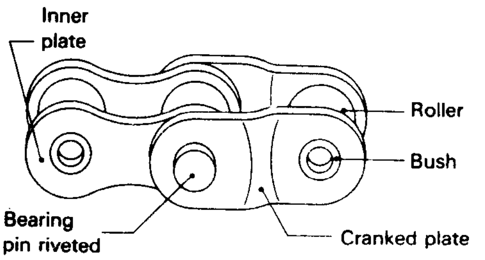


Other detachable connecting links

(Fasteners may be of various designs. Drawings indicate only their position.)



Cranked link single



Cranked link double

Figure 2 — Types of links

NOTE — Dimensional definitions are contained in the key to tables 1 and 2.

3.2 Designation

Transmission precision roller chains shall be designated by the standard ISO chain number given in tables 1 and 2, the first two digits expressing the pitch in sixteenths of an inch. The ISO chain numbers in tables 1 and ~~1M~~ are supplemented by a hyphenated suffix 1 for simple chain, 2 for duplex chain, 3 for triplex chain, etc., for example 16B-1, 16B-2, 16B-3, etc.

3.3 Dimensions

Chains shall conform to the dimensions given in tables 1 and 2. Maximum and minimum dimensions are specified to ensure interchangeability of links as produced by different makers of chain. They represent limits for interchangeability, but are not the actual tolerances that should be used in manufacture.

3.4 Minimum ultimate tensile strength

3.4.1 The minimum tensile strength is the minimum strength of samples tested to destruction in tensile loading, as defined in 3.4.2. This strength is not a working load. It is intended primarily as a comparative figure between chains of various constructions. For application information, the manufacturers or their published data should be consulted.

3.4.2 A tensile load, not less than that specified in table 1, or 2, is applied slowly to the ends of a chain length, containing at least five free pitches, by means of shackles permitting free movement on both sides of the chain centre line, in the normal plane of articulation.

Failure shall be considered to have occurred at the first point where increasing extension is no longer accompanied by increasing load, i.e. the summit of the load/extension diagram.

Tests in which failures occur adjacent to the shackles should be disregarded.

3.4.3 The tensile test shall be considered a destructive test. Even though a chain may not visibly fail when subjected to the minimum breaking load, it will have been stressed beyond the yield point and will be unfit for service.

3.5 Proof loading

It is recommended that all chains should be proof loaded to one-third of the minimum tensile breaking load given in tables 1 and 2.

3.6 Length accuracy

Finished chains shall be measured after proof loading (where applicable) but before lubricating.

The standard length for measurement shall be a minimum of :

a) 610 mm (24 in) for ISO chain numbers 05B to 12B and 081 to 085 inclusive,

b) 1 220 mm (48 in) for ISO chain numbers 16A to 72B inclusive,

and shall terminate with an inner link at each end.

The chain shall be supported throughout its entire length and the measuring load in tables 1 and 2 shall be applied.

To comply with this International Standard, the length shall be the nominal length subject to the limits of tolerance : $^{+0,15}_{\ \ 0}$ %.

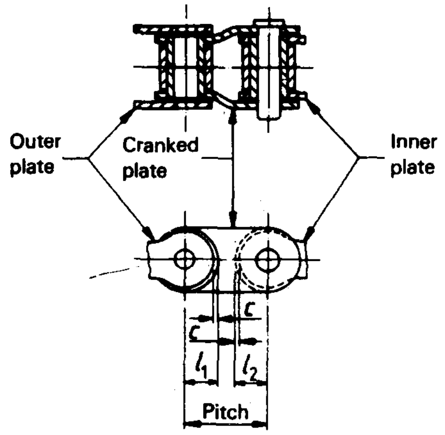
The length accuracy of chains which have to work in parallel shall be within the limits above but matched in agreement with the manufacturer.

3.7 Marking

The chain shall be marked with :

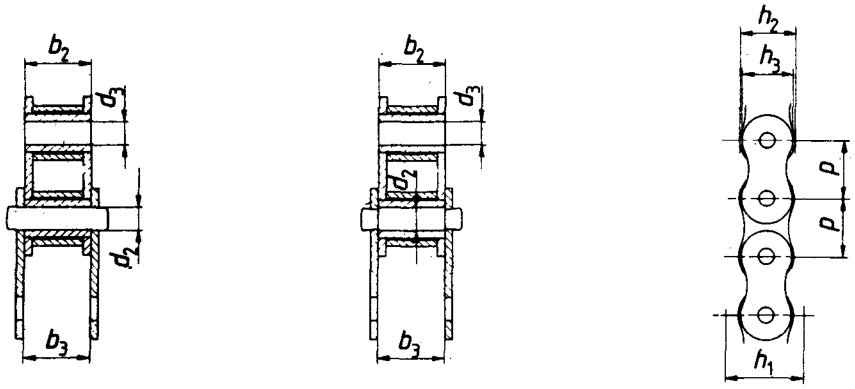
a) the manufacturer's name or trade mark;

b) the ISO chain number (see column 1 of tables 1 and 2.



Cranked link

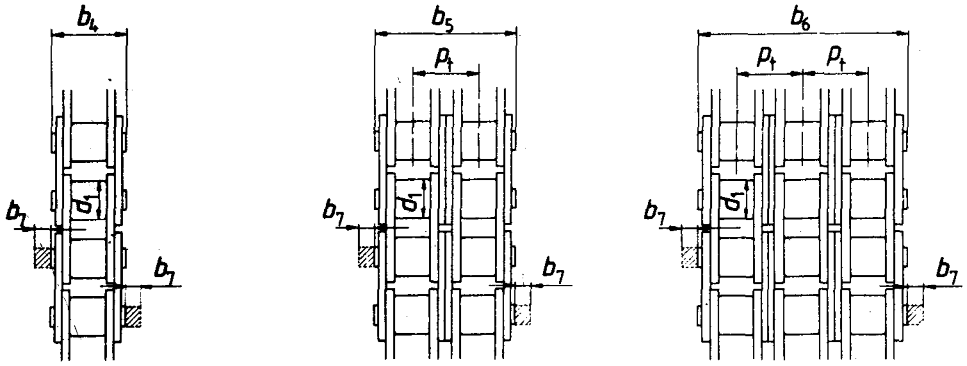
Dimension c represents the clearance between the cranked link plates and the straight plates available during articulation.



Plain pin **Shouldered pin**

Sections through chain

The chain path depth h_1 is the minimum depth of channel through which the assembled chain will pass.



Simple **Duplex** **Triplex**

The overall width of a chain with a joint fastener is equal to the width over the bearing pins b_4, b_5 or b_6 plus b_7 for riveted pin end (or + 1,6 b_7 for headed pin end) if fastener is on one side only, or + 2 b_7 if fastener is on both sides.

The width over bearing pins for chains wider than triplex is equal to $b_4 + p_t$ (number of strands in chain -1).

Figure 3 — Key to tables 1 and 2

Table 1 — Chain dimensions, measuring loads and breaking loads of base chains

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
ISO chain number	Pitch	Roller diameter	Width between inner plates	Bearing pin body diameter	Bush bore	Chain path depth	Inner plate depth	Outer intermediate plate depth	Cranked link dimensions 1)			Transverse pitch	Width over inner link	Width between outer plates	Width over bearing pins			Additional width for joint fastener 2)	Measuring load			Breaking load		
	—	—	—	—	—	—	—	—	—	—	—	—	—	—	Simple	Duplex	Triplex	—	Simple	Duplex	Triplex	Simple	Duplex	Triplex
	p	d_1 max.	b_1 min.	d_2 max.	d_3 min.	h_1 min.	h_2 max.	h_3 max.	l_1 min.	l_2 min.	c	p_t	b_2 max.	b_3 min.	b_4 max.	b_5 max.	b_6 max.	b_7 max.	—	—	—	min.	min.	min.
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	da N	da N	da N	da N	da N	da N
05B	8,00	5,00	3,00	2,31	2,36	7,37	7,11	7,11	3,71	3,71	0,08	5,64	4,77	4,90	8,6	14,3	19,9	3,1	5	10	15	440	780	1 110
06B	9,525	6,35	5,72	3,28	3,33	8,52	8,26	8,26	4,32	4,32	0,08	10,24	8,53	8,66	13,5	23,8	34,0	3,3	7	14	21	890	1 690	2 490
08A	12,70	7,95	7,85	3,96	4,01	12,33	12,07	10,41	5,28	6,10	0,08	14,38	11,18	11,23	17,8	32,3	46,7	3,9	12	25	37	1 380	2 760	4 140
08B	12,70	8,51	7,75	4,45	4,50	12,07	11,81	10,92	5,66	6,12	0,08	13,92	11,30	11,43	17,0	31,0	44,9	3,9	12	25	37	1 780	3 110	4 450
10A	15,875	10,16	9,40	5,08	5,13	15,35	15,09	13,03	6,60	7,62	0,10	18,11	13,84	13,89	21,8	39,9	57,9	4,1	20	39	59	2 180	4 360	6 540
10B	15,875	10,16	9,65	5,08	5,13	14,99	14,73	13,72	7,11	7,62	0,10	16,59	13,28	13,41	19,6	36,2	52,8	4,1	20	39	59	2 220	4 450	6 670
12A	19,05	11,91	12,57	5,94	5,99	18,34	18,08	15,62	7,90	9,14	0,10	22,78	17,75	17,81	26,9	49,8	72,6	4,6	28	56	84	3 110	6 230	9 340
12B	19,05	12,07	11,68	5,72	5,77	16,39	16,13	16,13	8,33	8,33	0,10	19,46	15,62	15,75	22,7	42,2	61,7	4,6	28	56	84	2 890	5 780	8 670
16A	25,40	15,88	15,75	7,92	7,97	24,39	24,13	20,83	10,54	12,19	0,13	29,29	22,61	22,66	33,5	62,7	91,9	5,4	50	100	149	5 560	11 120	16 680
16B	25,40	15,88	17,02	8,28	8,33	21,34	21,08	21,08	11,15	11,15	0,13	31,88	25,45	25,58	36,1	68,0	99,9	5,4	50	100	149	4 230	8 450	12 680
20A	31,75	19,05	18,90	9,53	9,58	30,48	30,18	26,04	13,16	15,24	0,15	35,76	27,46	27,51	41,1	77,0	113,0	6,1	78	156	234	8 670	17 350	26 020
20B	31,75	19,05	19,56	10,19	10,24	26,68	26,42	26,42	13,89	13,89	0,15	36,45	29,01	29,14	43,2	79,7	116,1	6,1	78	156	234	6 450	12 900	19 350
24A	38,10	22,23	25,22	11,10	11,15	36,55	36,20	31,24	15,80	18,26	0,18	45,44	35,46	35,51	50,8	96,3	141,7	6,6	111	222	334	12 460	24 910	37 370
24B	38,10	25,40	25,40	14,63	14,68	33,73	33,40	33,40	17,55	17,55	0,18	48,36	37,92	38,05	53,4	101,8	150,2	6,6	111	222	334	9 790	19 570	29 360
28A	44,45	25,40	25,22	12,70	12,75	42,67	42,24	36,45	18,42	21,31	0,20	48,87	37,19	37,24	54,9	103,6	152,4	7,4	151	302	454	16 900	33 810	50 710
28B	44,45	27,94	30,99	15,90	15,95	37,46	37,08	37,08	19,51	19,51	0,20	59,56	46,58	46,71	65,1	124,7	184,3	7,4	151	302	454	12 900	25 800	38 700
32A	50,80	28,58	31,55	14,27	14,32	48,74	48,26	41,66	21,03	24,33	0,20	58,55	45,21	45,26	65,5	124,2	182,9	7,9	200	400	601	22 240	44 480	66 720
32B	50,80	29,21	30,99	17,81	17,86	42,72	42,29	42,29	22,20	22,20	0,20	58,55	45,57	45,70	67,4	126,0	184,5	7,9	200	400	601	16 900	33 810	50 710
40A	63,50	39,68	37,85	19,84	19,89	60,93	60,33	52,07	26,24	30,35	0,20	71,55	54,89	54,94	80,3	161,9	223,5	10,2	311	623	934	34 700	69 390	104 090
40B	63,50	39,37	38,10	22,89	22,94	53,49	52,96	52,96	27,76	27,76	0,20	72,29	55,75	55,88	82,6	154,9	227,2	10,2	311	623	934	26 240	52 490	78 730
48A	76,20	47,63	47,35	23,80	23,85	73,13	72,39	62,48	31,45	36,40	0,20	87,83	67,82	67,87	95,5	183,4	271,3	10,5	445	890	1 334	50 040	100 080	150 130
48B	76,20	48,26	45,72	29,24	29,29	64,52	63,88	63,88	33,45	33,45	0,20	91,21	70,56	70,69	99,1	190,4	281,6	10,5	445	890	1 334	40 030	80 070	120 100
56B	88,90	53,98	53,34	34,32	34,37	78,64	77,85	77,85	40,61	40,61	0,20	106,60	81,33	81,46	114,6	221,2	—	11,7	609	1 219	—	54 270	108 540	—
64B	101,60	63,50	60,96	39,40	39,45	91,08	90,17	90,17	47,07	47,07	0,20	119,89	92,02	92,15	130,9	250,8	—	13,0	796	1 592	—	71 170	142 340	—
72B	114,30	72,39	68,58	44,48	44,53	104,67	103,63	103,63	53,37	53,37	0,20	136,27	103,81	103,94	147,4	283,7	—	14,3	1 010	2 019	—	89 850	179 710	—

---

1) Cranked links are not recommended for use on chains which are intended for onerous applications.

2) The actual dimensions will depend on the type of fastener used but they should not exceed the dimensions in this column, details of which should be obtained by the purchaser from the manufacturer.

NOTE — There are narrow versions of the simple chain, 08B and 10B respectively, having widths between inner plates of 5,21 mm (0.205 in) min. and 6,48 mm (0.255 in) min, which are used for motorcycle applications.

Table 2 — Chain dimensions, measuring loads and breaking loads of cycle and moped chains[1]

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
ISO chain number	Pitch	Roller diameter	Width between inner plates	Bearing pin body diameter	Bush bore	Chain path depth	Inner plate depth	Outer plate depth	Cranked link dimensions 2)			Width over inner link	Width between outer plates	Width over bearing pins	Additional width for joint fastener 3)	Measuring load	Breaking load
	p	d_1 max.	b_1 min.	d_2 max.	d_3 min.	h_1 min.	h_2 max.	h_3 max.	l_1 min.	l_2 min.	c	b_2 max.	b_3 min.	b_4 max.	b_7 max.	—	min.
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	da N	da N
081	12,70	7,75	3,30	3,66	3,71	10,17	9,91	9,91	5,36	5,36	0,08	5,80	5,93	10,2	1,5	12,5	800
082	12,70	7,75	2,38	3,66	3,71	10,17	9,91	9,91	5,36	5,36	0,08	4,60	4,73	8,2	4)	12,5	980
083	12,70	7,75	4,88	4,09	4,14	10,56	10,30	10,30	5,36	5,36	0,08	7,90	8,03	12,9	1,5	12,5	1 160
084	12,70	7,75	4,88	4,09	4,14	11,41	11,15	11,15	5,77	5,77	0,08	8,80	8,93	14,8	1,5	12,5	1 560
085	12,70	7,77	6,38	3,58	3,63	10,17	9,91	9,91	5,28	6,10	0,08	9,07	9,20	14,0	2,0	12,5	670

---

1) These chains are recommended in the single version only.

2) Cranked links are not recommended for use on chains which are intended for onerous applications.

3) The actual dimensions will depend on the type of fastener used but they should not exceed the dimensions in this column, details of which should be obtained by the purchaser from the manufacturer.

4) It is recommended that the joints for derailleur chain should always be riveted.

4 Attachments

4.1 General

Except when otherwise stated, the characteristics, dimensions and tests for the chain with attachments shall conform to the requirements of clause 3.

4.2 Designation

Two types of attachments are given, having the common dimensional basis as detailed in table 1 (columns 2, 3 and 4); their designation and distinguishing features are as follows :

— K1 : with one attachment hole centrally disposed in each platform;

— K2 : with two attachment holes longitudinally disposed as shown in figure 4.

4.3 Dimensions

Attachments shall conform to the dimensions given in table 3.

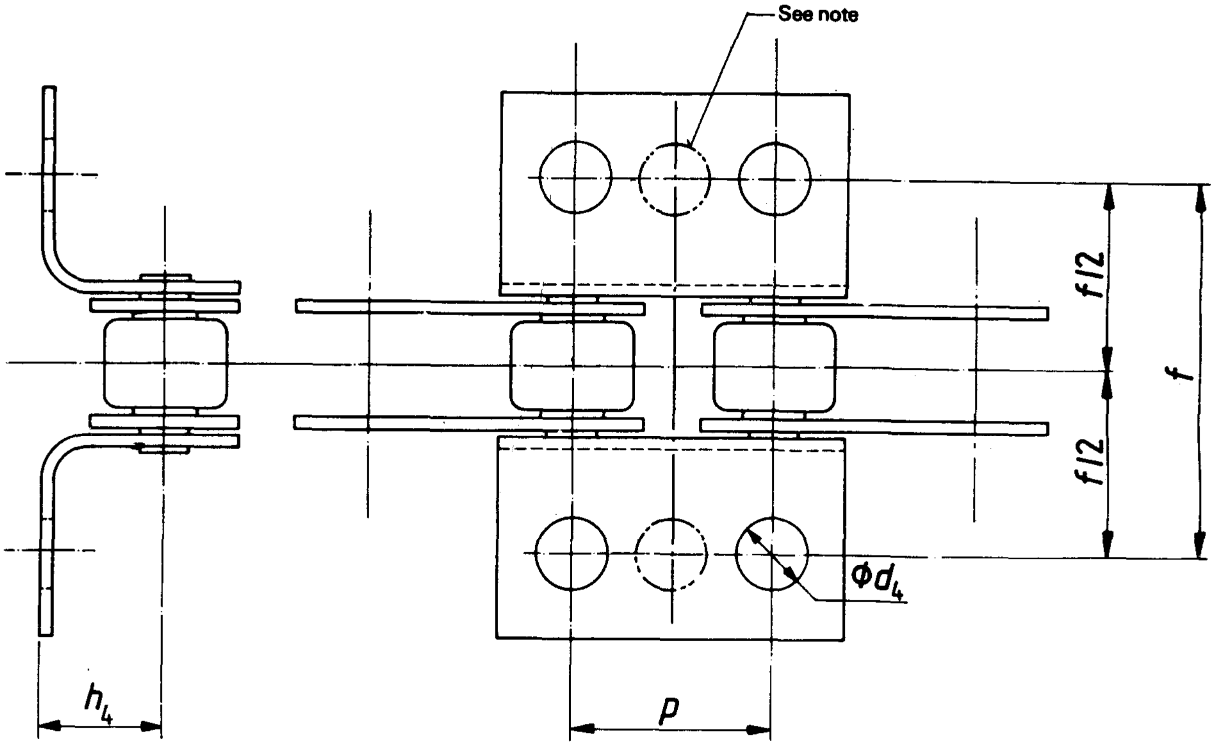
4.4 Manufacture

The actual form of the attachment plates is left to the discretion of the manufacturer, but the attachments are normally of integral construction whereby the chain plates are extended and bent over to make the platform, as shown in figure 4.

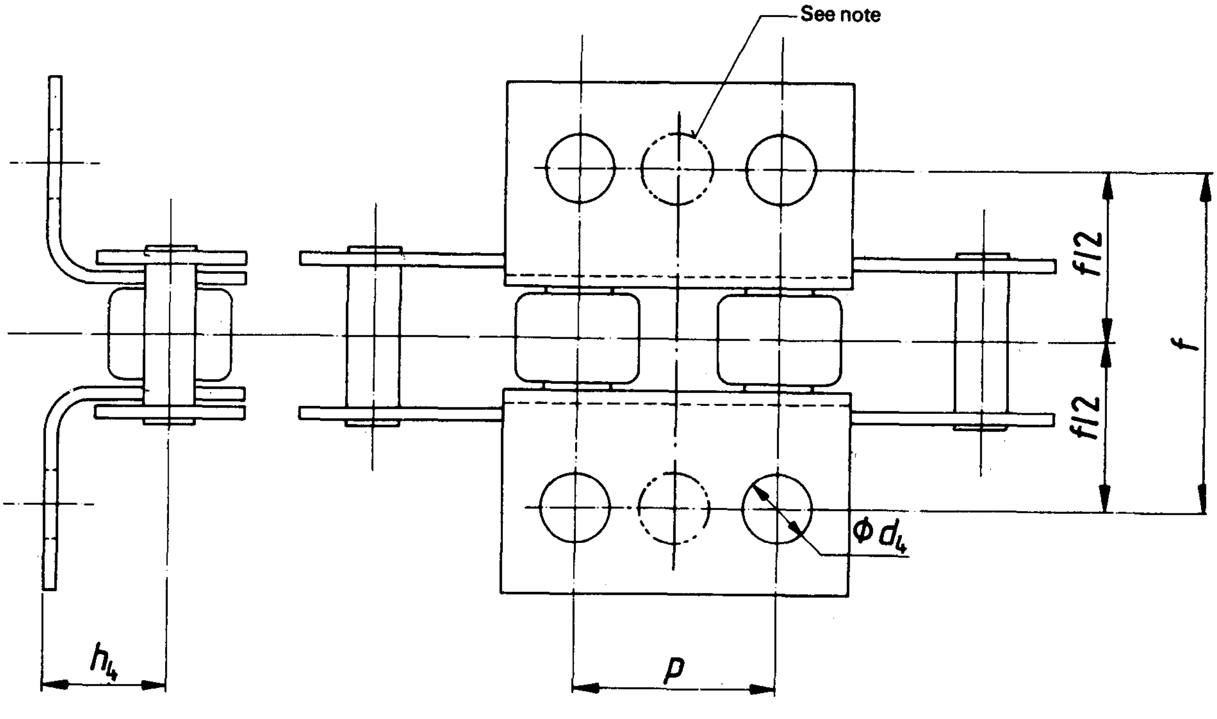
The length of the attachment plate is also left to the discretion of the manufacturer, but it should be sufficient to accommodate the two attachment holes longitudinally in the case of type K2, and not interfere with the working of the adjoining links. A common length is normally adopted for both type K1 and K2.

4.5 Marking

The marking shall be the same as would be shown on the chain plates replaced by an integral construction attachment (see 3.7).



On inner link



On outer link

Figure 4 — K attachments (key to table 3)

NOTE — K2 attachment plates each have two attachment holes. K1 plates are similar except that they have one hole, centrally disposed (see 4.2).

Table 3 — Dimensions of attachments

(1)	(2)	(3)	(4)
ISO chain number	**Platform height** h_4	**Hole diameter** d_4 min.	**Transverse distance between hole centres** f
08 A	7,92	3,3	25,40
08 B	8,89	4,3	
10 A	10,31	5,1	31,75
10 B		5,3	
12 A	11,91	5,1	38,10
12 B	13,46	6,4	
16 A	15,88	6,6	50,80
16 B		6,4	
20 A	19,84	8,2	63,50
20 B		8,4	
24 A	23,01	9,8	76,20
24 B	26,67	10,5	
28 A	28,58	11,4	88,90
28 B		13,1	
32 A **32 B**	31,75	13,1	101,60

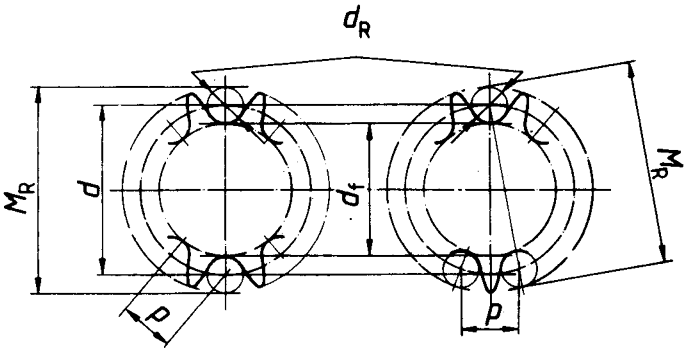
5 Chain wheels

5.1 Nomenclature

The nomenclature for basic chain dimensions on which all wheel data are based is given in figure 3. Chain wheel nomenclature is covered under the respective headings.

5.2 Diametral dimensions of wheel rim

5.2.1 Nomenclature



Even numbers of teeth

Odd numbers of teeth

p = chordal pitch, equal to chain pitch

d_R = measuring pin diameter

z = number of teeth

d = pitch circle diameter

d_f = root diameter

M_R = measurement over pins

5.2.2 Dimensions

5.2.2.1 Pitch circle diameter

$$d = \frac{p}{\sin \frac{180^\circ}{z}}$$

(see the annex for pitch circle diameters in relation to the number of teeth)

5.2.2.2 Measuring pin diameter

$d_R = d_1$ (see 5.3.1) subject to tolerance limits

+ 0.000 5 in (0,01 mm)
0

5.2.2.3 Root diameter

$d_f = d - d_1$ subject to the following tolerance limits :

Root diameter	Upper deviation	Lower deviation
$d_f < 5$ in (127 mm)	0	0.010 in (0,25 mm)
5 in (127 mm) $< d_f \leqslant$ 9.85 in (250 mm)	0	0.012 in (0,30 mm)
$d_f >$ 9.85 in (250 mm)	0	h11*

* See ISO 286.

5.2.2.4 Measurement over pins

M_R for *even* numbers of teeth $= d + d_R$ min.

M_R for *odd* numbers of teeth $= d \cos \dfrac{90^\circ}{z} + d_R$ min.

The measurement over pins of wheels with *even* numbers of teeth shall be carried out over pins inserted in opposite tooth gaps.

The measurement over pins of wheels with *odd* numbers of teeth shall be carried out over pins in the tooth gaps most nearly opposite.

The limits of tolerance for the measurement over pins are identical to those for corresponding root diameters.

5.3 Wheel tooth gap forms

5.3.1 Nomenclature

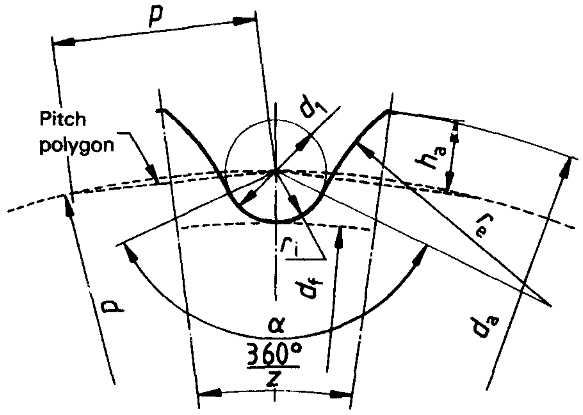


Figure 6 — Tooth gap forms

p = chordal pitch, equal to chain pitch

d = pitch circle diameter

d_1 = roller diameter, maximum

r_i = roller seating radius

α = roller seating angle

r_e = tooth flank radius

h_a = height of tooth above pitch polygon

d_a = tip diameter

d_f = root diameter

z = number of teeth

5.3.2 Dimensions

The limits of the tooth gap form are determined by the minimum and maximum tooth gap forms. The actual tooth gap form provided by cutting or an equivalent method shall have tooth flanks of a form lying between the minimum and maximum flank radii and blending smoothly with the roller seating curve subtending the respective angles.

5.3.2.1 Minimum form

r_e max. $= 0{,}12\, d_1 (z + 2)$

r_i min. $= 0{,}505\, d_1$

α max. $= 140^\circ - \dfrac{90^\circ}{z}$

5.3.2.2 Maximum form

r_e min. $= 0{,}008\, d_1 (z^2 + 180)$

r_i max. $= (0.505\, d_1 + 0.008 \sqrt[3]{d_1})$ in (where d_1 is expressed in inches)

or $= (0{,}505\, d_1 + 0{,}069 \sqrt[3]{d_1})$ mm (where d_1 is expressed in millimetres)

α min. $= 120^\circ - \dfrac{90^\circ}{z}$

5.4 Tooth heights and tip diameters

5.4.1 Nomenclature

See 5.3.

5.4.2 Dimensions

d_a max. $= d + 1{,}25\, p - d_1$

d_a min. $= d + p \left(1 - \dfrac{1{,}6}{z}\right) - d_1$

It should be noted that d_a min. and d_a max. can be applied arbitrarily both to the minimum and maximum gap forms, subject to the limitations imposed by the cutter on d_a max.

To facilitate the construction of the tooth gap form to a large scale on a drawing board, the tooth height above the pitch polygon can be obtained from the following formulae :

$$h_a \text{ max.} = 0{,}625\,p - 0{,}5\,d_1 + \frac{0{,}8\,p}{z}$$

$$h_a \text{ min.} = 0{,}5\,(p - d_1)$$

Note that h_a max. is related to d_a max., and h_a min. to d_a min.

5.5 Wheel rim profiles

5.5.1 Nomenclature

For wheel rim in axial plane sectioned through centre of tooth gap.

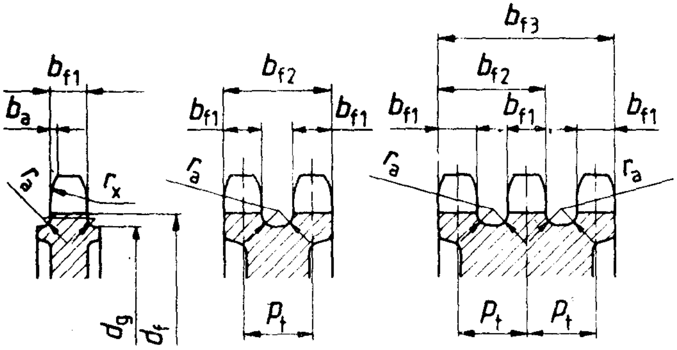


Figure 7 — Wheel rim profiles

b_{f1} = tooth width

b_{f2} and b_{f3} = widths over teeth

r_x = tooth side radius

b_a = tooth side relief

r_a = shroud fillet radius

d_g = absolute maximum shroud diameter

d_f = root diameter of wheels

p = chain pitch

p_t = transverse pitch of strands

b_1 = width between inner plates, minimum

h_2 = inner plate depth, maximum

5.5.2 Dimensions

		$p < 12{,}7$ mm (0.5 in)
b_{f1} for simple chain wheels	=	$0{,}93\,b_1$: h14*
b_{f1} for duplex and triplex chain wheels	=	$0{,}91\,b_1$: h14*
b_{f1} for quadruplex chain wheels and above	=	$0{,}88\,b_1$: h14*

		$p > 12{,}7$ mm (0.5 in)
b_{f1} for simple chain wheels	=	$0.95\,b_1$: h14*
b_{f1} for duplex and triplex chain wheels	=	$0.93\,b_1$: h14*
b_{f1} for quadruplex chain wheels and above	=	$0.93\,b_1$: h14*

NOTE — For chain wheels above 12,7 mm (0.5 in) in pitch, the figures in the first column may be used by agreement between the user and the manufacturer.

b_{f2} and b_{f3} = (number of strands − 1) × p_t + b_{f1} (tolerance h14* on b_{f1})

$r_{x\,\text{nom}} = p$

$b_{a\,\text{nom}} = 0.13\,p$ (for cycle and moped chains $b_{a\,\text{nom}} = 0.06\,p$)

$$d_g = p \cot \frac{180^\circ}{z} - 1.04\,h_2 - 0.030 \text{ in}$$

(where p and h_2 are expressed in inches);

or

$$= p \cot \frac{180^\circ}{z} - 1{,}04\,h_2 - 0{,}76 \text{ mm}$$

(where p and h_2 are expressed in millimetres).

5.6 Radial run-out

5.6.1 Nomenclature

See 5.2.

5.6.2 Values

Radial run-out between the bore and root diameter shall not exceed a value for total indicator reading derived from

> $0.000\,8\,d_f + 0.003$ in, or 0.006 in, whichever is the greater (where d_f is expressed in inches) up to a maximum of 0.030 in;

or

> $0{,}000\,8\,d_f + 0{,}08$ mm, or 0,15 mm, whichever is the greater (where d_f is expressed in millimetres) up to a maximum of 0,76 mm.

5.7 Axial run-out (wobble)

5.7.1 Nomenclature

See 5.2.

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* See ISO 286.

5.7.2 Values

Axial run-out, measured with reference to the bore and the flat part of the side face of the teeth, shall not exceed a value for total indicator reading derived from

> $0.000\,9\ d_f + 0.003$ in (where d_f is expressed in inches) up to a maximum of 0.045 in;

or

> $0{,}000\,9\ d_f + 0{,}08$ mm (where d_f is expressed in millimetres) up to a maximum of 1,14 mm.

For fabricated (welded) wheels, 0.010 in (0,25 mm) may be accepted if the above formulae give smaller values.

5.8 Pitch accuracy of wheel teeth

Pitch accuracy of wheel teeth is important and chain manufacturers should be consulted for details.

5.9 Range of teeth

This International Standard primarily applies to a range of teeth from 9 to 150 inclusive.

The preferred range of numbers of teeth is 17, 19, 21, 23, 25, 38, 57, 76, 95 and 114.

5.10 Bore tolerance

Unless otherwise agreed between the manufacturer and the purchaser, bores shall be to H8 limits.*

5.11 Marking

Wheels shall be marked with :

a) maker's name or trade mark;

b) number of teeth;

c) chain designation (ISO chain number and/or maker's equivalent).

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* See ISO 286.

Annex

Pitch circle diameters

The following table gives correct pitch circle diameters for wheels to suit a chain of unit pitch (for example 1 in, 1 mm). The pitch circle diameters for wheels to suit a chain of any other pitch are directly proportional to the pitch of the chain.

Number of teeth z	Pitch circle diameter	Number of teeth z	Pitch circle diameter	Number of teeth z	Pitch circle diameter
9	2,923 8	**57**	18,152 9	**105**	33,427 5
10	3,236 1	**58**	18,471 0	**106**	33,745 8
11	3,549 4	**59**	18,789 2	**107**	34,064 0
12	3,863 7	**60**	19,107 3	**108**	34,382 3
13	4,178 6	**61**	19,425 5	**109**	34,700 6
14	4,494 0	**62**	19,743 7	**110**	35,018 8
15	4,809 7	**63**	20,061 9	**111**	35,337 1
16	5,125 8	**64**	20,380 0	**112**	35,655 4
17	5,442 2	**65**	20,698 2	**113**	35,973 7
18	5,758 8	**66**	21,016 4	**114**	36,291 9
19	6,075 5	**67**	21,334 6	**115**	36,610 2
20	6,392 5	**68**	21,652 8	**116**	36,928 5
21	6,709 5	**69**	21,971 0	**117**	37,246 7
22	7,026 6	**70**	22,289 2	**118**	37,565 0
23	7,343 9	**71**	22,607 4	**119**	37,883 3
24	7,661 3	**72**	22,925 6	**120**	38,201 6
25	7,978 7	**73**	23,243 8	**121**	38,519 8
26	8,296 2	**74**	23,562 0	**122**	38,838 1
27	8,613 8	**75**	23,880 2	**123**	39,156 4
28	8,931 4	**76**	24,198 5	**124**	39,474 6
29	9,249 1	**77**	24,516 7	**125**	39,792 9
30	9,566 8	**78**	24,834 9	**126**	40,111 2
31	9,884 5	**79**	25,153 1	**127**	40,429 5
32	10,202 3	**80**	25,471 3	**128**	40,747 8
33	10,520 1	**81**	25,789 6	**129**	41,066 0
34	10,838 0	**82**	26,107 8	**130**	41,384 3
35	11,155 8	**83**	26,426 0	**131**	41,702 6
36	11,473 7	**84**	26,744 3	**132**	42,020 9
37	11,791 6	**85**	27,062 5	**133**	42,339 1
38	12,109 6	**86**	27,380 7	**134**	42,657 4
39	12,427 5	**87**	27,699 0	**135**	42,975 7
40	12,745 5	**88**	28,017 2	**136**	43,294 0
41	13,063 5	**89**	28,335 5	**137**	43,612 3
42	13,381 5	**90**	28,653 7	**138**	43,930 6
43	13,699 5	**91**	28,971 9	**139**	44,248 8
44	14,017 6	**92**	29,290 2	**140**	44,567 1
45	14,335 6	**93**	29,608 4	**141**	44,885 4
46	14,653 7	**94**	29,926 7	**142**	45,203 7
47	14,971 7	**95**	30,244 9	**143**	45,522 0
48	15,289 8	**96**	30,563 2	**144**	45,840 3
49	15,607 9	**97**	30,861 5	**145**	46,158 5
50	15,926 0	**98**	31,199 7	**146**	46,476 8
51	16,244 1	**99**	31,518 0	**147**	46,795 1
52	16,562 2	**100**	31,836 2	**148**	47,113 4
53	16,880 3	**101**	32,154 5	**149**	47,431 7
54	17,198 4	**102**	32,472 7	**150**	47,750 0
55	17,516 6	**103**	32,791 0		
56	17,834 7	**104**	33,109 3		

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